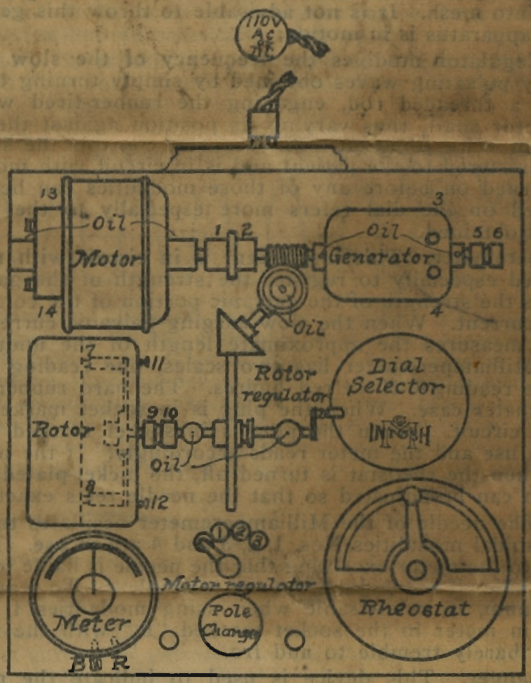
DIRECTIONS FOR OPERATING
McIntosh No. 4 Polysine Generator



To Connect in Circuit. The apparatus may be connected and operated by 110 volt direct current or by 110 volt alternating current, 25-60 cycles. On the outer edge of the frame just behind the motor and generator will be noted two metal plugs. The black stage connector on one end of the attachment cord and plug should be fitted to these plugs and the attachment plug should be screwed into any lamp socket.

The Motor Regulator. A four-button switch will be noted just above the pole changer. This serves as a rheostat for starting the motor and for regulating the frequency of the rapid sinusoidal. The motor will not start into action until this has been turned on. To use modalities 2, 3, 4, 6 or 7, this switch should be turned on to full speed, otherwise there will not be sufficient voltage generated by the generator. For rapid sinusoidal or combined galvanic and sinusoidal, however, the lower speeds will be found of advantage in some cases.

The Generating Set. This consists of a universal motor, shown at the upper left-hand corner, which is direct-connected by a special noiseless joint to a direct current generator with tapped armature, which generates a direct current of 140 volts, suitable for galvanism, and an alternating or rapid sinusoidal current of 110 volts. The universal motor may be operated with either direct current or with an alternating current of 25 to 60 cycles per second.

The Dial Selector. This instrument controls the operation of the entire apparatus. One motion of the knob on dial selector makes eight contacts on the special selective switch contained on the back of the switchboard. The pointer must rest exactly opposite the indicating mark in order to insure the correct placement of the selective switch.

The Rotor Clutch. Just to the right of the base of the friction hub will be noted a worm gear which meshes with the worm on the shaft between the motor and generator. When this gear is in mesh the rotor mechanism is in operation and modalities 2, 3, 4 and 6 may be employed. However, when modalities 1, 5 and 7 are in use the knob at the top of the worm gear may be raised, thus throwing the gears out of mesh. There is a small spring inside of the gear collar which holds the worm gear suspended and prevents it from dropping back into mesh. It is not advisable to throw this gear in or out of mesh when the apparatus is in motion.

The Rotor Regulator modifies the frequency of the slow sinusoidal and the other slowly pulsating waves obtained by simply turning the little crank, which controls a threaded rod, engaging the rubber-tired wheel, which is keyed to the rotor shaft, thus varying its position against the friction cone.

The MacLagan Wire Rheostat. The rheostat controls the strength of current to be administered to the patient and is in circuit with modalities 1 to 8, and must be turned on before any of those modalities can be secured. The voltage indicated on the dial refers more especially to the voltage of the galvanic current obtained.

The Milliamperemeter. This instrument is in circuit with modalities 1 to 7 and is intended especially to register the strength of the galvanic current. It also measures the strength of the galvanic portion of the combined galvanic and sinusoidal current. When the slow surging galvanic current, No. 6, is in use, the meter measures the approximate length of the undulations of the current. The Milliamperemeter has two scales, one reading 0-150 in black figures, and one reading 0-30 in red figures. The hard rubber plug has two sockets in the meter case. When the plug is in socket marked "R," the red scale 0-30 is in circuit. When the plug is in socket marked "B," the black scale 0-150 is in use and the meter reads accordingly. If the needle does not stand at zero when the rheostat is turned off, the nickel-plated knob attached to the scale pan can be adjusted so that the needle rests exactly at zero.

Important! The needle of the Milliamperemeter oscillates to and fro when any of the sinusoidal modalities Nos. 1, 2, 3 and 4 are in use. This oscillation is not injurious to the meter excepting that the needle is liable to strike against the posts at the sides if the undulations are too violent. To reduce this oscillation to a minimum, it is advisable when using modalities 1, 2, 3 and 4 to place the plug in meter in the socket marked "B," with the result that the needle will just barely tremble to and fro.

The Pole Changer. This device is used to indicate the polarity of the galvanic current and to change the poles if desired. The words "Positive" and "Negative" must occupy a lateral position in use. When these words occupy a horizontal position the circuit is broken and no current can be obtained. The words should always, therefore, occupy a lateral position regardless of what current is being used.

Hydro-Therapeutic Work. All currents obtained from the machine are ungrounded and may be used in bath application by using the McIntosh bath-tub electrodes and heavy waterproof bath cords.

Hints for Testing. If upon testing the apparatus no current is obtained, the following points are suggested for attention: First, the pole changer—see that the wording is lateral; second, examine the brushes and see that they are intact; third, see that the commutators and collecting rings are free of dust and oil; fourth, unscrew the knobs 11 and 12 and lift off the left-hand portion of rotor case and examine the rotor brushes 7 and 8 to see if they are intact; also look at brushes 9 and 10 on rotor shaft; fifth, if trying galvanic current, see that the meter plug is in socket "R," and remember Ohm's law. (The current equals the voltage divided by the resistance.) Only a small reading can be had with one electrode in either hand.

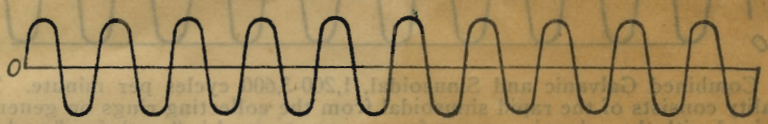
Oiling. Examine the oil cups on motor once a month. They should be filled with a hard cup grease; vaseline will do. Examine oil cups on generator about once a month. The oil holes on rotor supports marked in diagram should receive a few drops of thin oil once a week or so, as well as the oil hole in the standard supporting friction cone and the oil holes on worm gear.

Renewals. Practically the only renewals required by this machine are the brushes, ten in number (Nos. 3, 4, 5, 6, 7, 8, 9, 10, 13, 14) as indicated in diagram, which can be supplied at ten cents each. When ordering brushes, please refer to diagram and specify by number.

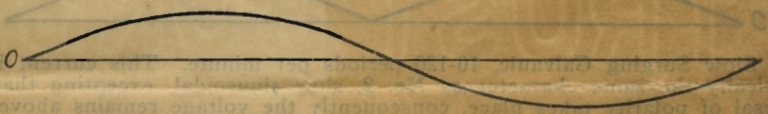
In case it becomes necessary to replace the rubber friction rings it will be necessary to remove the cover of the rotor case by loosening screws 11 and 12 and then to remove the rotor shaft so as to release the rubber friction wheel. To remove the rotor shaft it will be necessary to loosen four set screws, namely one in the collar at the crank post, one in the hub of the friction wheel, one between the rings in the commutator and one in the hub of the rotor brush arm. In removing the shaft do not let the carbon brushes or the springs fly out of the sockets. It is rarely necessary to renew the rubber tires as the spring in the friction hub automatically takes up the wear in the tire.

Note. The motor is especially constructed to withstand heat. Do not be alarmed if it gets very hot if running for some time. If motor heats, examine oil cups at once; if empty, replenish.

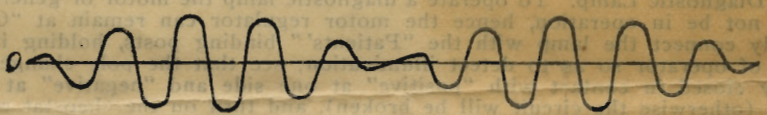
Modalities Available



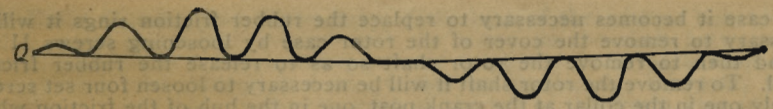
1. Rapid Sinusoidal, 1,200-3,600 cycles per minute. This current is secured from the collecting rings on the generator, and varies according to the speed at which the generator runs. This is regulated by means of the motor regulator. When using a slow frequency it will be necessary to turn the rheostat farther to secure satisfactory muscular contraction than if a more rapid frequency is employed. The milliamperemeter does not measure this current, but if a very strong current is used, it may deflect the needle violently. To reduce this to a minimum, place the plug in meter in socket "B" and it will not be injured.



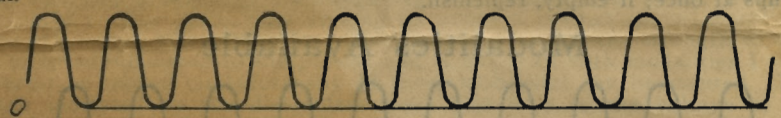
2. Slow Sinusoidal, 10-120 cycles per minute. This current is produced by passing the direct current or galvanic current obtained from generator through the rotor or resistance winding. Turn on motor regulator to full speed and then adjust the frequency of the slow sinusoidal by means of the rotor regulator. When using a very slow frequency the rheostat should be turned on very slowly, otherwise one might turn it on precipitately when the sine wave is at low voltage and when the high point is reached an unexpected shock would be obtained. The frequency of the sine wave can be altered after the electrodes are on the patient without discomfort, as changing the frequency has no effect upon the voltage, which is determined by the position of the rheostat lever. The meter responds to the slow sinusoidal current, showing the oscillation from side to side when using the slower frequencies, but as the more rapid speeds are used, the needle is unable to respond to the rapid oscillations. To reduce the oscillation to a minimum, place plug in meter in socket "B."



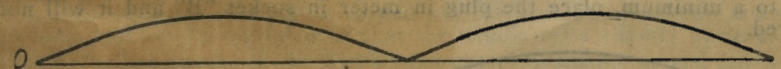
3. Surging Sinusoidal, 10-120 cycles per minute. This modality is secured by passing the rapid sinusoidal current through the rotor, producing a compound sine wave. The ratio of the rapid waves to the slow waves varies from 1,200 to 3,600 for the rapid to 10-120 for the slow sine waves. The best results will be obtained, however, by turning the motor regulator on to full speed and then regulating the frequency of the slow sine waves by means of the rotor regulator. The meter does not respond to this current except when a heavy volume is used, when it becomes deflected same as with rapid sinusoidal. When using this current, place plug in meter in socket "B." Voltage is regulated with rheostat.



4. Superimposed Wave, 10-120 cycles per minute. This current is composed of the combined galvanic and sinusoidal current sent through the rotor and broken up into a slow sine wave somewhat similar in formation to No. 2, but possessing the undulatory character of No. 3. The meter responds to this current, especially when using the slower frequency, and shows the approximate length of the undulations. The voltage is regulated with rheostat as usual.



5. Combined Galvanic and Sinusoidal, 1,200-3,600 cycles per minute. This modality consists of the rapid sinusoidal from the collecting rings on generator combined with the galvanic current from generator and is "earth-free" and "ungrounded" and may be employed in electric baths with perfect safety. The frequency of the rapid sine waves may be modified by means of the motor regulator, although this same regulation reduces the speed of the generator, consequently limiting the amount of galvanic current secured. The ratio of galvanism and sinusoidal cannot be modified, as they are both controlled by the same rheostat. The milliamperemeter responds to this current and plug should be in socket "R" for this purpose.



6. Slow Surging Galvanic, 10-120 periods per minute. This current is of practically the same character as No. 2, slow sinusoidal, excepting that no reversal of polarity takes place, consequently the voltage remains above the line, thus partaking of galvanic properties with polar effects and concentrating the contractions more markedly at the negative pole. The motor regulator should be turned on to full speed, the frequency adjusted by means of the rotor regulator, while the voltage is controlled by means of the rheostat. The milliamperemeter indicates the strength of the oscillations and their frequency, if not too rapid.

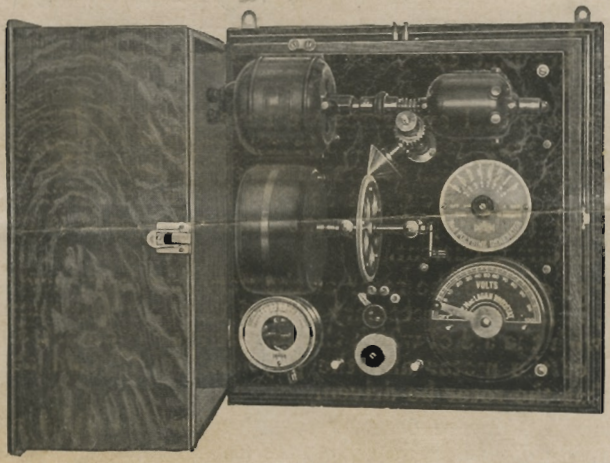
7. Galvanic. To obtain this current the motor regulator should be turned on to full speed and the voltage regulated by means of the rheostat. The meter registers accurately the dosage secured. Full information regarding the meter is obtained under that heading. When employing the galvanic current the rotor clutch should be thrown out of contact so as to prevent unnecessary wear to the rotor parts. The polarity of the galvanic current is indicated by the pole changer.

8. Diagnostic Lamp. To operate a diagnostic lamp the motor or generator need not be in operation, hence the motor regulator can remain at "Off." Simply connect the lamp with the "Patients'" binding posts, holding it in view of operator so as to detect illumination; see that the pole changer is firmly closed in contact with "positive" at one side and "negative" at the other (otherwise the circuit will be broken), and turn on the rheostat carefully. It will be found in many cases that the lamp will not become illuminated until the rheostat lever reaches 70 or 80, and in many cases 90 or 95. Lamps need the closest watching to avoid burning them out. After ascertaining what voltage is needed to light a certain lamp, one can be governed accordingly. Always observe the lamp during process of illumination, until you ascertain just what voltage is needed to illuminate it before placing it in situ.

McINTOSH BATTERY & OPTICAL CO.
CHICAGO, ILLINOIS

The Impossible Accomplished

A Sinusoidal Apparatus Which Operates on Either Alternating or Direct Current



McINTOSH NO. 4 POLYSINE GENERATOR
(Shown in vertical position as a wall plate)

PRICE for 110 volt direct current or 110 volt alternating current, 25-60 cycles $225.00

WHY YOU SHOULD OWN IT

1. Strongest Slow Sinusoidal of any apparatus on the market.
2. Most Simple in Operation. Dial Selector eliminates confusing switches.
3. Safest in Use. All currents are "earth free;" no danger of shock or "ground."
4. Operates on A. C. or D. C. The only sinusoidal and galvanic combination so adapted.
5. Most Symmetrical Sine Wave of any yet produced. Oscillagraph tracings corroborate claim.
6. Most Practical Frequency Regulation afforded by friction gear—no belts or pulleys whatever.
7. Most Compact, measuring only 19 inches square and 10½ inches deep.
8. Lowest in Price. You save the extra cost of a motor or generator on A. C.

MANUFACTURED BY

McIntosh Battery & Optical Co.

Main Office and Factory: 217-223 N. Desplaines St. Chicago, Ill.
Eastern Office and Service Station: 1777 Broadway, New York

McINTOSH NO. 4 POLYSINE GENERATOR

WE PRESENT herewith an ideal combination of galvanic and sinusoidal apparatus which may be operated interchangeably on either alternating or direct current. Practically every other wall plate or sinusoidal apparatus on the market is intended for direct current, thus necessitating the use of a generating set on alternating current causing an extra expense and necessitating extra wiring.

This compact unit comprises generating set and switchboard all in one case.

On this new model apparatus we have mounted a universal motor which operates at a speed of 4,500 revolutions per minute, which is connected to a generator which generates not only galvanic current, but rapid sinusoidal or alternating current as well; hence the modalities obtained from the apparatus are precisely the same whether it is operated with alternating or direct current.

In order to operate the rotor at the very low frequency of ten cycles per minute, it has been necessary to add not only a friction gear but a worm gear with the aid of which the correct ratio is obtained between the fixed speed of the motor and the physiological rhythm at which it is necessary that the rotor be driven.

Resistance lamps are entirely dispensed with in this apparatus by the substitution of fixed wire resistance units which are unbreakable and which protect the apparatus against short circuit.

A rheostat connected in circuit with the motor permits of regulation of the speed of the generator, thus affording control of the frequency of the rapid sinusoidal current.

The high speed of the motor and generator produces a galvanic current which is extremely smooth in character owing to the rapid make and break at the commutator making the interruption imperceptible.

When using rapid sinusoidal, combined galvanic and sinusoidal or galvanic currents, the rotor mechanism can be left idle by simply raising the toothed gear wheel which meshes with the worm gear on the motor shaft.

The term "Polysine," as our readers are doubtless aware, is a coined word from "poly"—many; and "sine"—sine wave, indicating that the apparatus supplies many forms of sine waves.

The Generating Set. This consists of a universal motor shown at the upper left-hand corner which is direct connected by a special noiseless joint to a direct current generator with tapped armature which generates a direct current of 140 volts, suitable for galvanism; and an alternating or rapid sinusoidal current of 110 volts. The universal motor may be operated with either direct current or with an alternating current of 25 to 60 cycles per second.

The Sinusoidal Rotor. The slow sinusoidal current is obtained by passing the direct current from the generator through the rotor, which consists of a wire resistance unit against which two carbon brushes revolve,

increasing and decreasing the resistance rhythmically and producing a sine wave which is geometrically exact. The brushes revolve in a circle, hence there is no point of the sine wave which is more abrupt than other sections as with the spiral shaped contacts of other machines; neither is there any hiatus or pause such as occurs with the reciprocating pistons used on other makes.

The MacLagan Wire Rheostat. The voltage of the slow sinusoidal current is regulated independently of the wave length or frequency by means of the MacLagan Wire Rheostat, which places the strength of current absolutely at the command of operator. Similar regulation is afforded of the voltage of all of the other modalities.

The Friction Gear modifies the frequency of the slow sinusoidal and the other slowly pulsating waves obtained, by simply turning the little crank at the end of the rotor shaft which controls a threaded rod engaging the rubber tired wheel which is keyed to the rotor shaft, thus varying its position against the friction cone. The operation of these contacts is absolutely noiseless.

The Milliamperemeter, our improved condensed type with shunt, scales reading 0-150 and 0-30, registers the oscillations of the slow sinusoidal current and approximate strength of the undulations of the surging galvanic current as well as measuring accurately the dosage of the straight galvanic current and combined galvanic and sinusoidal.

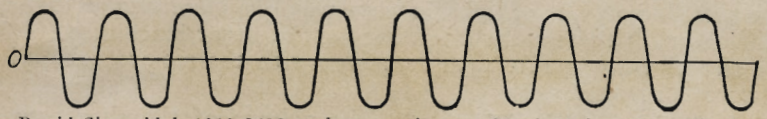
Very Simple to Operate. Any one of the eight modalities available may be instantly selected by simply turning the knob on dial selector opposite the respective name, which is plainly indicated on dial. This is a great improvement over other makes of sinusoidal apparatus, which are supplied with an imposing array of switches.

SAFETY FIRST! This is the only sinusoidal apparatus made in which all danger of a shock from a "grounded" wire has been eliminated. All currents delivered to the patient are produced in the direct current generator, which has absolutely no metallic contact with the motor driving same, hence all currents obtained from this apparatus are said to be "earth-free" or free from "ground" connection.

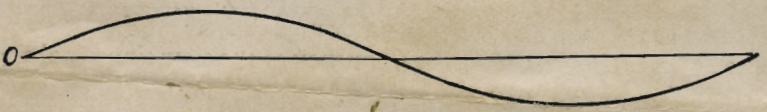
Useful in Hydro-Therapy. This feature makes the apparatus eminently adapted to hydro-therapeutic work and renders it the best possible equipment for sanitariums and institutions in general.

Attractive Appearance. The Motor, Generator, Rotor, Rheostat and Dial Selector are all finished in black enamel, while the meter and smaller parts are finely nickel-plated; all mounted upon a handsome, black marbleized slate base. The apparatus is encased in an artistic cabinet of highly polished quarter-sawed golden oak measuring 19 inches square and 10½ inches deep, the cover being fitted with beveled plate glass. The apparatus is constructed in such a manner that it may be employed either as a wall plate or as a table plate. The cut shows it placed on the wall in vertical position as a wall plate. It is equally well adapted for use in a horizontal position. A pair of conducting cords, handles, sponge discs and full directions for operating are included with the apparatus.

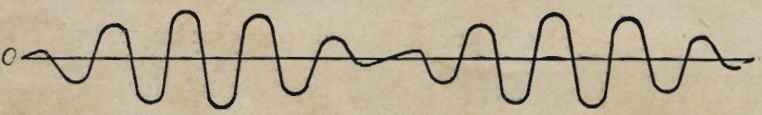
Results Afforded



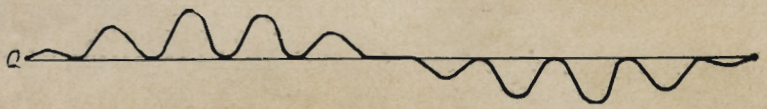
1. Rapid Sinusoidal, 1200-3600 cycles per minute. Obtained from the collecting rings on generator. Frequency is controlled by motor rheostat. Utilized for eliciting the vertebral reflexes and for stimulation of muscular tissue. Far superior to faradic current for general use.



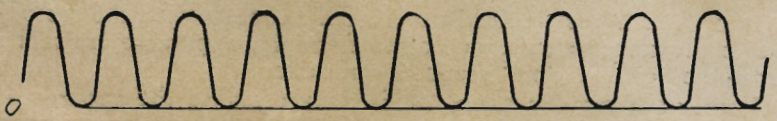
2. Slow Sinusoidal, 10-120 cycles per minute. The current par excellence for involuntary muscles, such as stomach and intestines. Very soothing for hyperesthesias and for anaesthetizing sensitive areas, as trigeminal neuralgia, etc.



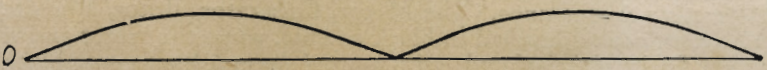
3. Surging Sinusoidal, 10-120 cycles per minute. This is obtained by passing the rapid sinusoidal current through the rotor, producing a compound sine wave. It has proven of great value in contracting the abdominal muscles through the spinal centers.



4. Superimposed Wave, 10-120 cycles per minute. This consists of the combined galvanic and sinusoidal current sent through the rotor. It is much more tonic and stimulating than the slow sinusoidal and can be used to good advantage in auto intoxication.



5. Combined Galvanic and Sinusoidal, 1200-3600 cycles per minute. Combines the tonic properties of the rapid sinusoidal with the distinctive polar effects of the galvanic.



6. Slow Surging Galvanic, 10-120 periods per minute. This current has practically the same sensation as the slow sinusoidal but the contraction can be concentrated at one pole. Often of value in different forms of paralysis. It combines the chemical action of the galvanic with the stimulation of the slow sinusoidal.

7. Galvanic. This modality possesses all of the characteristic effects which have been accredited to this form of current, such as electrolysis, cataphoresis; and may be employed in gynecology, G.-U. work, rectal treatment, facial blemishes or any of the well known applications of this current.

8. Diagnostic Lamp. Practically any auriscope, urethroscope, cystoscope or transilluminator can be lighted to full brilliance and controlled perfectly with rheostat.

Red spots indicate oilingpoints. Keeping bearings well oiled, and brushes clean will assure good results. Do not wipe any part of machine with linty cloth.

NOTICE.

To engage rotor, press this knob down; to disengage rotor, pull knob up gently. Rotor must be in operation on modalities No. 2, 3, 4 and 6.

Current for Modality No. 8 (Diagnostic Lamp) being supplied direct from the line, motor can be at rest when this Modality is used.

NOTICE.

When selecting a modality, always have point of indicator in center of round spot at desired modality.